IN THE CLAIMS:

1. (Currently Amended) An information disk recording/reproducing device, in which recording or reproduction can be performed on an information disk having an information recording track formed like a spiral or a concentric circle, comprising:

a disk rotating unit for rotating ~~the~~ an information disk;

a rotational position information output unit for outputting rotational position information ~~for the information disk of~~ based on information indicating a rotation angle of the disk rotating unit ~~in each area provided~~ by dividing one rotation into m angular divisions ~~(m is a natural number equal to or larger than 2)~~;

a reading unit for reading an information signal from ~~the~~ an information disk;

a radius direction driving unit for driving the reading unit in a radius direction of ~~the~~ an information disk;

a track cross detecting unit for detecting ~~a~~ crossing of a ~~track cross caused by crossing~~ and generating a track cross signal based on a reproduction signal when the reading unit traverses an ~~is traversed on the~~ information recording track by the driving of the radius direction driving unit;

a track cross direction detecting unit for detecting a direction of a ~~the~~ track crossing caused by a ~~the~~ crossing based on the reproduction signal when the reading unit traverses an ~~is traversed on the~~ information recording track by the driving of the radius direction driving unit;

a counting unit for counting pulses of a track cross signal from the track cross detecting unit, with a code indicating a track cross direction from the track cross direction detecting unit, based on an output from the rotational position information output unit ~~in each of the areas divided into m~~; and

a control unit which rotates the disk rotating unit at a first speed, obtains a first counted value of the counting unit while not operating ~~making~~ the radius direction driving unit ~~nonoperational~~, rotates the disk rotating unit at one or more ~~kinds of rotational speeds of second, third, ...~~ rotational speeds higher than a ~~the~~ first rotational speed, obtains a second~~, third, ...~~ counted value ~~values of~~ from the counting unit while not operating ~~making~~ the radius direction driving unit ~~nonoperational~~, and compares ~~a difference between the first counted value and the second, third, ... counted values with~~ a predetermined threshold value ~~so as~~ to ~~determine a maximum rotational speed of the information disk while using, as~~ a vibration detection value~~, a value proportionate to~~ as a function of a sum of absolute values of a difference between the first counted value and the second counted value ~~values obtained in the areas divided into m~~.

2. (Currently Amended) An information disk recording/reproducing device, in which recording or reproduction can be performed on an information disk having an information recording track formed like a spiral or a concentric circle, comprising:

a disk rotating unit for rotating ~~the~~ an information disk;

a rotational position information output unit for outputting rotational position information ~~for the information disk of~~ based on information indicating a rotation angle of the disk rotating unit ~~in each area provided~~ by dividing one rotation into n angular divisions ~~(n is a natural number equal to or larger than 2)~~;

a rotational position information dividing unit which further divides each of the n angular divisons into k subdivisions ~~(k is a natural number equal to or larger than 1) the area having been provided by dividing one rotation into n for the rotational position information from the rotational position information output unit~~ and outputs the rotational position information ~~in each of m = n k areas~~;

a reading unit for reading an information signal from ~~the~~ an information disk;

a radius direction driving unit for driving the reading unit in the radius direction of ~~the~~ an information disk;

a track cross detecting unit for detecting crossing of a track ~~cross caused by crossing~~ and generating a track cross signal based on a reproduction signal when the reading unit traverses an ~~is traversed on the~~ information recording track by the driving of the radius direction driving unit;

a track cross direction detecting unit for detecting a direction of a ~~the~~ track cross caused by a ~~the~~ crossing based on the reproduction signal when the reading unit traverses an ~~is traversed on the~~ information recording track by the driving of the radius direction driving unit;

a counting unit for counting pulses of a track cross signal from the track cross detecting

unit, with a code indicating a track cross direction from the track cross direction detecting unit, based on an output from the rotational position information dividing unit ~~in each of the areas divided into m~~; and

a control unit which rotates the disk rotating unit at a first speed, obtains a first counted value of the counting unit while not operating ~~making~~ the radius direction driving unit ~~nonoperational~~, rotates the disk rotating unit at one or more ~~kinds of rotational speeds of second, third, ...~~ rotational speeds higher than a ~~the~~ first rotational speed, obtains a second~~, third, ...~~ counted value ~~values of~~ from the counting unit while not operating ~~making~~ the radius direction driving unit ~~nonoperational~~, and compares ~~a difference between the first counted value and the second, third, ... counted values with~~ a predetermined threshold value ~~so as~~ to ~~determine a maximum rotational speed of the information disk while using, as~~ a vibration detection value~~, a value proportionate to~~ as a function of a sum of absolute values of a difference between the first counted value and the second counted value ~~values obtained in the areas divided into m~~.

3. (Currently Amended) The information disk recording/reproducing device according to claim 1 , wherein in each of the m angular divisions ~~areas divided into m,~~ a difference between the first counted value and the second counted value ~~at the first rotational speed and the counted value at each of the second, third, ... rotational speeds~~ is expressed by the equation below:

DAT [1] ~DAT [m]

(Equation 1)

a vibration quantity at this point is approximated by the equation below:

$$\text{VIBRATION QUANTITY} = \frac{1}{4}\sum_{x=1}^{m} |DAT[x]|$$

(Equation 2)

and a value proportionate to the vibration quantity is used as a vibration detection value.

4. (Currently Amended) The information disk recording/reproducing device according to claim 1, wherein in each of the m angular divisions ~~areas divided into m,~~ a difference between the first counted value and the second counted value ~~at the first rotational speed and the counted value at each of the second, third, ... rotational speeds~~ is expressed by the equation below:

DAT [1] ~DAT [m]

(Equation 3)

a vibration quantity at this point is approximated by the equation below:

$$\text{VIBRATION QUANTITY} = \frac{1}{4}\sum_{x=1}^{m} |DAT[x]|$$

(Equation 4)

a value proportionate to the vibration quantity is used as a vibration detection value, and the m angular divisions for one rotation, is determined within a permissible error range based on a maximum value of an error relative to an actual vibration quantity at this point, the maximum value being expressed by the equation below:

$$\text{ERROR} \leq 1 - \cos\frac{\pi}{m}$$

(Equation 5)

5. (Currently Amended) The information disk recording/reproducing device according to claim 1, wherein in each of the m angular divisions ~~areas divided into m,~~ a difference between the first counted value and the second counted value ~~at the first rotational speed and the counted value at each of the second, third, ... rotational speeds~~ is expressed by the equation below:

DAT [1] ~DAT [m]

(Equation 6)

a vibration quantity at this point is approximated by the equation below:

$$\text{VIBRATION QUANTITY} = \frac{1}{4}\sum_{x=1}^{m} |DAT[x]| \quad \text{(Equation 7)}$$

a value proportionate to the vibration quantity is used as a vibration detection value, and the m angular divisions for one rotation is set at 24 so that an error relative to an actual vibration quantity at this point has a maximum value of 1% or less.

6. (Currently Amended) A method for controlling a recording/reproducing speed of an information disk recording/reproducing device, in which recording or reproduction can be performed on an information disk having an information recording track formed like a spiral or a concentric circle, the device comprising a disk rotating unit for rotating the information disk, a reading unit for reading an information signal from the information disk, and a radius direction driving unit for driving the reading unit in a radius direction of the information disk, the method

comprising the steps of:

rotating ~~the~~ an information disk;

outputting rotational position information ~~for the information disk in each area provided~~ by dividing one rotation into m angular divisions ~~(m is a natural number equal to or larger than 2)~~;

reading an information signal from ~~the~~ an information disk;

driving the reading unit in the radius direction of ~~the~~ an information disk;

detecting a crossing of a track ~~cross caused by crossing~~ and generating a track cross signal based on a reproduction signal when the reading unit traverses an ~~is traversed on the~~ information recording track by the driving of the radius direction driving unit;

detecting a direction of ~~the~~ a track cross caused by ~~the~~ a crossing based on the reproduction signal when the reading unit traverses an ~~is traversed on the~~ information recording track by the driving of the radius direction driving unit;

counting pulses of a track cross signal, with a code indicating the track cross direction, to obtain a first counted value ~~in each of the areas provided~~ by dividing one rotation of the rotational position information into m angular divisions while rotating the disk rotating unit at a first speed and not operating ~~making~~ the radius direction driving unit ~~nonoperational~~;

counting pulses of the track cross signal, with the code indicating the track cross direction, to obtain a second~~, third, ...~~ counted value ~~values~~ ~~in each of the areas provided~~ by

dividing one rotation of the rotational position information into m angular divisions while rotating the disk rotating unit at one or more ~~kinds of second, third, ...~~ speeds higher than ~~the~~ a first speed and not operating ~~making~~ the radius direction driving unit ~~nonoperational~~; and

comparing ~~a difference between the first counted value and the second, third, ... counted values with~~ a predetermined threshold value ~~so as~~ to ~~determine a maximum rotational speed of the information disk while using, as~~ a vibration detection value~~, a value proportionate to~~ as a function of a sum of absolute values of a difference between the first counted value and the second counted value ~~values obtained in the areas divided into m~~.

7. (Currently Amended) A method for controlling a recording/reproducing speed of an information disk recording/reproducing device, in which recording or reproduction can be performed on an information disk having an information recording track formed like a spiral or a concentric circle, the device comprising a disk rotating unit for rotating the information disk, a reading unit for reading an information signal from the information disk, and a radius direction driving unit for driving the reading unit in a radius direction of the information disk, the method comprising the steps of:

rotating ~~the~~ an information disk;

outputting rotational position information ~~for the information disk in each of m = n·k areas provided by further~~ by dividing one rotation into m angular divisions and subdividing each

m angular division ~~dividing~~ into k subdivisions ~~(k is a natural number equal to or larger than 1) an area having been provided by dividing one rotation into m (m is a natural number equal to or larger than 2)~~;

reading an information signal from ~~the~~ an information disk;

driving the reading unit in the radius direction of ~~the~~ an information disk;

detecting a crossing of a track ~~cross caused by crossing~~ and generating a track cross signal based on a reproduction signal when the reading unit traverses an ~~is traversed on the~~ information recording track by the driving of the radius direction driving unit;

detecting a direction of the track cross caused by the crossing based on the reproduction signal when the reading unit traverses an ~~is traversed on the~~ information recording track by the driving of the radius direction driving unit;

counting pulses of the track cross signal, with a code indicating a ~~the~~ track cross direction, to obtain a first counted value ~~in each of the areas provided~~ by dividing one rotation of the rotational position information into m angular divisions while rotating the disk rotating unit at a first speed and not operating ~~making~~ the radius direction driving unit ~~nonoperational~~;

counting pulses of the track cross signal, with the code indicating a ~~the~~ track cross direction, to obtain a second~~, third, ...~~ counted value ~~values~~ in each of the areas provided by dividing one rotation of the rotational position information into m angular divisions while rotating the disk rotating unit at one or more ~~kinds of second, third, ...~~ rotational speeds higher

than a ~~the~~ first rotational speed and not operating ~~making~~ the radius direction driving unit ~~nonoperational~~; and

comparing ~~a difference between the first counted value and the second, third, ... counted values with~~ a predetermined threshold value ~~so as~~ to ~~determine a maximum rotational speed of the information disk while using, as~~ a vibration detection value~~, a value proportionate to~~ as a function of a sum of absolute values of a difference between the first counted value and the second counted value ~~values obtained in the areas divided into m~~.

8. (Currently Amended) The method for controlling a recording/reproducing speed of an information disk recording/reproducing device according claim 6 , wherein in each of the m angular divisions ~~areas divided into m,~~ a difference between the first counted value and the second counted value ~~at the first rotational speed and the counted value at each of the second, third, ... rotational speeds~~ is expressed by the equation below:

$$DAT[1] \sim DAT[m]$$

(Equation 8)

a vibration quantity at this point is approximated by the equation below:

$$\text{VIBRATION QUANTITY} = \frac{1}{4}\sum_{x=1}^{m} |DAT[x]|$$

(Equation 9)

and a value proportionate to the vibration quantity is used as a vibration detection value.

9.(Currently Amended) The method for controlling a recording/reproducing speed

of the information disk recording/reproducing device according claim 6 , wherein in each of the m angular divisions ~~areas divided into m,~~ a difference between the first counted value and the second counted value ~~at the first rotational speed and the counted value at each of the second, third, ... rotational speeds~~ is expressed by the equation below:

$$DAT[1] \sim DAT[m]$$

(Equation 10)

a vibration quantity at this point is approximated by the equation below:

$$\text{VIBRATION QUANTITY} = \frac{1}{4}\sum_{x=1}^{m} |DAT[x]|$$

(Equation 11)

a value proportionate to the vibration quantity is used as a vibration detection value, and the m angular divisions for one rotation is determined within a permissible error range based on a maximum value of an error relative to an actual vibration quantity at this point, the maximum value being expressed by the equation below:

$$\text{ERROR} \leq 1 - \cos\frac{\pi}{m}$$

(Equation 12)

10. (Currently Amended) The method for controlling a recording/reproducing speed of the information disk recording/reproducing device according to claim 6 , wherein in each of the m angular divisions ~~areas divided into m,~~ a difference between the first counted value and the second counted value ~~at the first rotational speed and the counted value at each of the second, third, ... rotational speeds~~ is expressed by the equation below:

DAT [1] ~DAT [m]

(Equation 13)

a vibration quantity at this point is approximated by the equation below:

$$\text{VIBRATION QUANTITY} = \frac{1}{4}\sum_{x=1}^{m} |DAT[x]| \quad \text{(Equation 14)}$$

a value proportionate to the vibration quantity is used as a vibration detection value, and the m angular divisions for one rotation is set at 24 so that an error relative to an actual vibration quantity at this point has a maximum value of 1% or less.